



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,132	11/06/2000	Greg Pellegrino	P00-3251	8788

7590

08/14/2003

William J Kubida Esq
Hogan & Hartson LLP
One Tabor Center
1200 17th Street Suite 1500
Denver, CO 80202

EXAMINER

CHU, GABRIEL L

ART UNIT	PAPER NUMBER
----------	--------------

2184

2

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/707,132

Applicant(s)

PELLEGRINO ET AL.

Examiner

Gabriel L. Chu

Art Unit

2184

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 13, 14, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 6, 7, 13-15, and 19 are objected to because of the following informalities:

Referring to claims 6, 7, 13, and 14, "the target node" is understood to refer to "the target node of the at least two target nodes".

Referring to line 5 of claim 15, "network interconnect" is understood to refer to "a network interconnect".

Referring to line 14 of claim 15, "the first target" is understood to refer to "the first target node".

Referring to line 2 of claim 19, "the dataset" is understood to refer to "the mirrored dataset".

Referring to line 5 of claim 19, "a second node" is understood to refer to "a second storage node".

Referring to lines 8 and 10 of claim 19, "the node" is understood to refer to "the first node".

Referring to line 11 of claim 19, "the first path has good status..." is understood to refer to "if the first path has good status...".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2184

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 8-10, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6535518 to Hu et al. Referring to claim 1, Hu et al. disclose a host bus adapter for interconnecting a computer system to a storage area network (See figure 9.) comprising hardware for transmission of frames (From line 35 of column 8, "If a match is found, the subsequent data (until the end of the http payload; perhaps an html file) will be forwarded per the router; otherwise, the http payload will be sent to the server for further processing (the default route)."); hardware for reception of frames (From line 31 of column 8, "An incoming user/client request is received from Ethernet interface..."); memory for storage of frames (From line 64 of column 8, "A pool of memory is used to dynamically control the traffic and buffer asynchronous flows. Control Unit (300) coordinates all the activities."); a processor for processing frames, the processor coupled to the hardware for transmission of frames, the hardware for reception of frames, and the memory for storage of frames, wherein the processor is capable of inspecting frames for encapsulated write requests and, if encapsulated write request frames are found, deencapsulating the write request and forwarding the write request through the hardware for transmission of frames to a target node of the write request (From line 31 of column 8, "An incoming user/client request is received from Ethernet interface (310) and decoded at different layers from the Ethernet format (311) and IP/TCP (312) format. Then http header is parsed against the Expanded Routing

Art Unit: 2184

Table residing in the Router (313, 314 and 315). If a match is found, the subsequent data (until the end of the http payload; perhaps an html file) will be forwarded per the router; otherwise, the http payload will be sent to the server for further processing (the default route). A routing table match indicates an established (authorized) connection. For example, if the data is sent to storage, it may be an authorized WRITE to the storage. The data routed to the server can either be an initial request for access or server-oriented traffic. The server may process the request with a log-in (if applicable) using an authentication, authorization, and accounting (AAA) process. The software on the server will communicate with the device for all necessary setup (e.g., routing table and file system for the storage) through the Router Control (316) and Scheduler (in 315) and then pass the control to the device and notify the storage to start a response to that request with a given file ID (or name) for the file system (351) through the control path. The file system (351) then can issue commands to SCSI Interface (350) to fetch the data.”).

Referring to claims 2 and 9, Hu et al. disclose the processor further inspects frames for responses to encapsulated write requests and, when such responses are found, forwards the responses to a source node from which the original encapsulated write request frames came (From line 53 of column 8, “When the response data in html format comes back from storage, it will be correlated to an established connection in the ERT (315) for proper path (314). Then an http header will be added (322). TCP/IP protocol conversion is carried out on the device (321 and 320). Finally, the data will be packed in Ethernet packets and sent out through the Ethernet Interface (310). The

transfer from the storage to the network through the device for this connection will continue until it is completed or the device is notified by the server or storage to stop sending under certain events (e.g., error or user jumping to another web page).”).

Referring to claims 3 and 10, Hu et al. disclose simultaneous connection to at least two links, having a transmitter and a receiver for coupling to each link (From line 37 of column 8, “forwarded per the router; otherwise, the http payload will be sent to the server”. Further, from line 46 of column 8, “The software on the server will communicate with the device for all necessary setup (e.g., routing table and file system for the storage) through the Router Control (316) and Scheduler (in 315) and then pass the control to the device and notify the storage to start a response to that request with a given file ID (or name) for the file system (351) through the control path.” Further, from line 53 of column 8, “When the response data in html format comes back from storage, it will be correlated to an established connection in the ERT (315) for proper path (314).”).

Referring to claim 8, Hu et al. disclose a node for connection to a storage area network (See figure 9.) comprising hardware for transmission of frames (From line 35 of column 8, “If a match is found, the subsequent data (until the end of the http payload; perhaps an html file) will be forwarded per the router; otherwise, the http payload will be sent to the server for further processing (the default route).”); hardware for reception of frames (From line 31 of column 8, “An incoming user/client request is received from Ethernet interface...”).; memory (From line 64 of column 8, “A pool of memory is used to

Art Unit: 2184

dynamically control the traffic and buffer asynchronous flows. Control Unit (300) coordinates all the activities."); at least one processor for processing frames, the processor coupled to the hardware for transmission of frames, the hardware for reception of frames, and the memory for storage of frames, wherein the processor is capable of inspecting frames for encapsulated write requests and, if encapsulated write request frames are found, deencapsulating the write request and forwarding the write request through the hardware for transmission of frames to a target node of the write request (From line 31 of column 8, "An incoming user/client request is received from Ethernet interface (310) and decoded at different layers from the Ethernet format (311) and IP/TCP (312) format. Then http header is parsed against the Expanded Routing Table residing in the Router (313, 314 and 315). If a match is found, the subsequent data (until the end of the http payload; perhaps an html file) will be forwarded per the router; otherwise, the http payload will be sent to the server for further processing (the default route). A routing table match indicates an established (authorized) connection. For example, if the data is sent to storage, it may be an authorized WRITE to the storage. The data routed to the server can either be an initial request for access or server-oriented traffic. The server may process the request with a log-in (if applicable) using an authentication, authorization, and accounting (AAA) process. The software on the server will communicate with the device for all necessary setup (e.g., routing table and file system for the storage) through the Router Control (316) and Scheduler (in 315) and then pass the control to the device and notify the storage to start a response to that request with a given file ID (or name) for the file system (351) through the control path.

The file system (351) then can issue commands to SCSI Interface (350) to fetch the data.”).

Referring to claim 15, Hu et al. disclose A computer network comprising: a first node (From line 31 of column 8, “An incoming user/client request is received from Ethernet interface...”); a second node (From figure 9, a routing mechanism is shown.); a first target node (From figure 9, a SAN is shown.); a network interconnect providing communication between the first node and the second node, and providing communication between the second node and the first target node (From figure 9, it is shown that the network is interconnected with the routing mechanisms, and that the routing mechanisms are further interconnected with the SAN.); wherein the second node is capable of inspecting incoming frames for encapsulated write requests and, if encapsulated write request frames are found, deencapsulating a write request from the encapsulated write request frames and forwarding the write request to the first target node (From line 31 of column 8, “An incoming user/client request is received from Ethernet interface (310) and decoded at different layers from the Ethernet format (311) and IP/TCP (312) format. Then http header is parsed against the Expanded Routing Table residing in the Router (313, 314 and 315). If a match is found, the subsequent data (until the end of the http payload; perhaps an html file) will be forwarded per the router; otherwise, the http payload will be sent to the server for further processing (the default route). A routing table match indicates an established (authorized) connection. For example, if the data is sent to storage, it may be an authorized WRITE to the storage. The data routed to the server can either be an initial request for access or

server-oriented traffic. The server may process the request with a log-in (if applicable) using an authentication, authorization, and accounting (AAA) process. The software on the server will communicate with the device for all necessary setup (e.g., routing table and file system for the storage) through the Router Control (316) and Scheduler (in 315) and then pass the control to the device and notify the storage to start a response to that request with a given file ID (or name) for the file system (351) through the control path. The file system (351) then can issue commands to SCSI Interface (350) to fetch the data.”); and wherein the second node further is capable of inspecting frames received from the first target node for responses to previously forwarded encapsulated write requests and, when responses to previously forwarded encapsulated write requests are found, forwarding the responses to the first node (From line 53 of column 8, “When the response data in html format comes back from storage, it will be correlated to an established connection in the ERT (315) for proper path (314). Then an http header will be added (322). TCP/IP protocol conversion is carried out on the device (321 and 320). Finally, the data will be packed in Ethernet packets and sent out through the Ethernet Interface (310). The transfer from the storage to the network through the device for this connection will continue until it is completed or the device is notified by the server or storage to stop sending under certain events (e.g., error or user jumping to another web page).”).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims are 4, 11, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6535518 to Hu et al. as applied to claims 2, 9, and 15 above, in further view of US 5216619 to Dunbar, Jr. et al. Referring to claims 4 and 11, although Hu et al. do not specifically disclose responding to a query frame, the query frame containing a request for status of any path that might exist from the host bus adapter to a specified target node, querying to determine the status of a connection between two nodes is known in the art. An example of this is shown by Dunbar, Jr. et al. from line 50 of column 4, "Paths themselves have states. An operator or engineer may have reason to query the status of a path, and the management of paths requires they have interrogatable statuses. Paths have at least the following states: In-use, meaning the path has been selected by an operator. The path remains in-use until it is dissolved by the path/agent who invoked it." A person of ordinary skill in the art at the time of the invention would have been motivated to query the status of a path because, from line 50 of column 4, "An operator or engineer may have reason to query the status of a path, and the management of paths requires they have interrogatable statuses."

Referring to claim 16, although Hu et al. do not specifically disclose the second node is capable of responding to a path query frame with a status of a path from the second node to the first target node, querying to determine the status of a connection between two nodes is known in the art. An example of this is shown by Dunbar, Jr. et al. from line 50 of column 4, "Paths themselves have states. An operator or engineer may

have reason to query the status of a path, and the management of paths requires they have interrogatable statuses. Paths have at least the following states: In-use, meaning the path has been selected by an operator. The path remains in-use until it is dissolved by the path/agent who invoked it." A person of ordinary skill in the art at the time of the invention would have been motivated to query the status of a path because, from line 50 of column 4, "An operator or engineer may have reason to query the status of a path, and the management of paths requires they have interrogatable statuses."

Referring to claim 17, Hu et al. disclose the network interconnect is fibre channel compatible (From line 9 of column 8, "In this description, there are three types of logical medium interfaces: the network, storage and server(s). In actual implementation, various physical interfaces are possible, e.g., multiple network interfaces or storage interfaces or multiple servers. Buffers are used to synchronize transmission between interfaces. An example of implementation may be Ethernet, ATM or SONET for network interface, SCSI, Fibre Channel, PCI, InfiniBand, or other system I/O technology.").

6. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6535518 to Hu et al. as applied to claims 1 and 8 above, and further in view of US 5155845 to Beal et al. Referring to claims 5 and 12, although Hu et al. do not specifically disclose maintaining a mirrored dataset on at least two target nodes, a mirrored dataset is known in the art. An example of this is shown by Beal et al. from the abstract, "A disk storage system that writes multiple copies of records directed to user-specified volumes. A plurality of spaced apart control units interconnected by direct

data links and a corresponding plurality of sets of recording means communicate over the direct data links when a write request is received by one control unit to cause one volume in each set of recording means to write a copy of the received record." A person of ordinary skill in the art at the time of the invention would have been motivated to maintain a mirrored dataset because, from line 62 of column 2, "the failure of a single system component will not prevent a connected host from obtaining access to stored data records".

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6535518 to Hu et al. and US 5216619 to Dunbar, Jr. et al. as applied to claim 17 above, and further in view of US 5155845 to Beal et al. Referring to claim 18, although Hu et al. and Daniel, III et al. do not specifically disclose a second target node and the network interconnect further provides communication between the second target node and the first node; and wherein the first node is capable of maintaining a mirrored data set having a copy on the first target node and the second target node, a mirrored dataset is known in the art. An example of this is shown by Beal et al. from the abstract, "A disk storage system that writes multiple copies of records directed to user-specified volumes. A plurality of spaced apart control units interconnected by direct data links and a corresponding plurality of sets of recording means communicate over the direct data links when a write request is received by one control unit to cause one volume in each set of recording means to write a copy of the received record." A person of ordinary skill in the art at the time of the invention would have been motivated to maintain a mirrored

dataset because, from line 62 of column 2, "the failure of a single system component will not prevent a connected host from obtaining access to stored data records".

Allowable Subject Matter

8. Claims 6, 7, 13, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Referring to claims 6, 13, and 14, the prior art does not teach or fairly suggest, in light of the parent claims, determining that it has no direct path to a target node of the at least two target nodes, and, when no direct path exists, is capable of requesting that another node perform a surrogate write to the target node of the at least two target nodes.

Referring to claim 7, the prior art does not teach or fairly suggest, in light of the parent claims, scanning nodes to determine a node capable of performing a surrogate write to the target node of the at least two target nodes.

9. Claim 19, and subsequently claim 20, are objected to as having objectionable material, but would be allowable if rewritten to overcome the objectionable material. Referring to claims 19 and 20, the prior art does not teach or fairly suggest if the surrogate-capable node has a path having good status to the second storage node, encapsulating a write request to the second copy and transmitting that encapsulated write request to the surrogate-capable node, and de-encapsulating the encapsulated write request to the second copy and forwarding it from the surrogate-capable node to the second storage node, in a method of performing writes by a first node of a storage area network to a mirrored dataset, the mirrored dataset comprising a first copy on a

first storage node of the storage area network and a second copy on a second storage node of the storage area network, the storage area network having a surrogate-capable node, the method comprising the steps of: checking a status of a first path from the first node to the first storage node and of a second path from the first node to the second storage node; if the first path has good status and the second path has bad status, then: performing a write to the first copy of the mirrored dataset over the first path; polling the surrogate-capable node to determine whether the surrogate-capable node has a path having good status to the second storage node.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5544347 to Yanai et al.

US 5633999 to Clowes et al.

US 5668943 to Atanasio et al.

US 6101508 to Wolff

US 6389432 to Pothapragada et al.

US 6400730 to Latif et al.


US 6564336 to Majkowski

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gabriel L. Chu whose telephone number is (703) 308-7298. The examiner can normally be reached on weekdays with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel, Jr. can be reached on (703) 305-9713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

gc
August 9, 2003


ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100